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(54) **Home appliance with lighting system**

(57) The home appliance has a functional cavity (3) capable of being closed by an access door (4) and provided with a lamp (5) that is adapted to be operated selectively to illuminate said cavity. Through a window

(14), part of the light generated by the lamp (5) is transferred outside the home appliance in the form of coded light information under control of a programme sequence control unit (9).

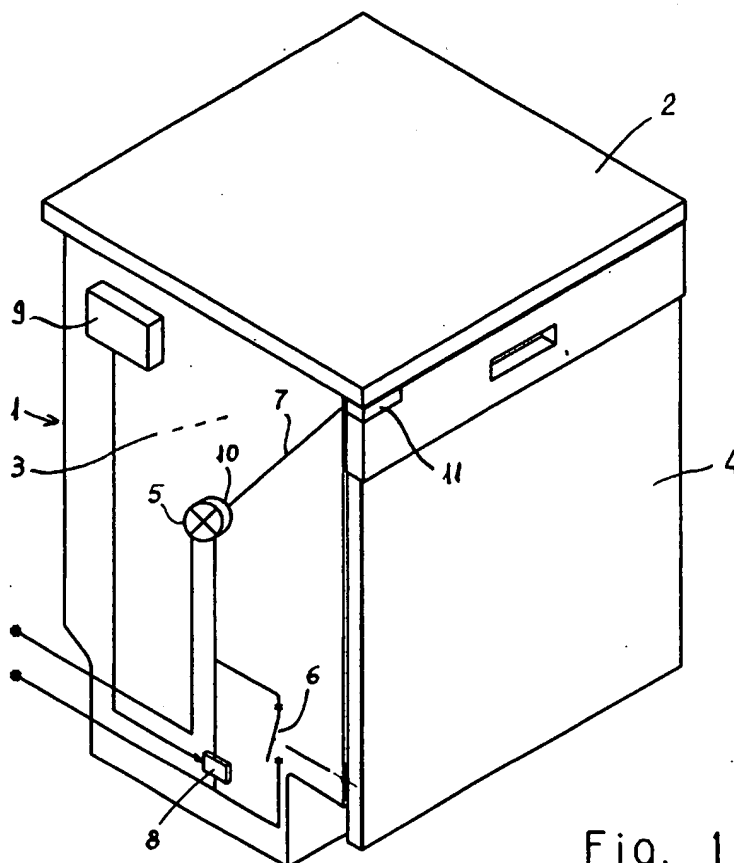


Fig. 1

Description

[0001] The present invention refers to a home appliance, such as a refrigeration appliance, a cooking oven, a dishwashing machine, or the like, provided with a lighting system of its own.

[0002] Household refrigerators and some dishwashing machines are largely known in the art to comprise means adapted to automatically light up the interior of the appliance whenever an access door of the same appliance is opened.

[0003] Equally well-known in the art is the fact that cooking ovens, for example, are provided with a see-through front window, through which the interior of the appliance can be inspected or surveyed visually also during the operation of the oven, by selectively switching on, with the aid of a switch arranged on the outside, lighting means situated inside the cooking cavity of the oven itself.

[0004] On the other hand, most of these household appliances are generally known to be provided with indication means adapted to display functional information concerning the operating state of the appliance, such as for instance the state of progress of the various operating programmes that are from time to time set for the appliance to carry out and/or the end of the operating cycle. To such a purpose, home appliances comprise appropriate devices, such as indicator lights arranged on the outside, electromechanical indicator devices, and the like.

[0005] It is a purpose of the present invention to provide a home appliance provided with a particularly simple and reliable lighting system, which also enables functional information to be effectively displayed.

[0006] Another purpose of the present invention is to provide a home appliance of the above cited kind, which uses a particularly reduced number of component parts so as to simplify both the structure and the assembly of the home appliance and, as a result, correspondingly reduce also the costs for manufacturing it on an industrial scale.

[0007] According to the present invention, these and further aims are reached in a home appliance provided with a lighting system incorporating the characteristics as recited in the appended claims.

[0008] Anyway, features and advantages of the present invention will be more readily understood from the description that is given below by way of nonlimiting example with reference to the accompanying drawings, in which:

- Figure 1 is a perspective schematic see-through view of an embodiment of the home appliance according to the present invention;
- Figure 2 is a schematic view of an enlarged detail of the home appliance of Figure 1, according to a constructional variant thereof; and

- Figure 3 is a perspective schematic see-through view of a further embodiment of the home appliance according to the present invention.

[0009] The home appliance according to the present invention may for example be a refrigeration appliance, or a dishwashing machine, comprising an outer casing 1 with a worktop surface 2.

[0010] The outer casing 1 accommodates at least an inner functional cavity 3, which in the case of a dishwashing machine is a washing vessel having an open front side that is capable of being closed, under interposition of a sealing gasket (not shown), by an access door 4 hinged at its lower side on a horizontal axis.

[0011] In a per se known manner, to the cavity 3 there is associated at least a lamp 5, or other equivalent lighting means, adapted to selectively light up the same cavity, for instance when the access door 4 is opened. To such a purpose, the lamp 5 may be energized via a power-supply circuit comprising a normally open switch 6 adapted to close in response to the door 4 being opened.

[0012] According to an aspect of the present invention, there are provided photoconductive means, which in the embodiment illustrated in Figure 1 may comprise an optical-fibre cable 7, or the like, adapted to transfer part of the light generated by the lamp 5 outside the home appliance in the form of coded light information.

[0013] Furthermore, in parallel to said normally open switch 6 there is arranged a switch 8 controlled by the programme sequence control unit 9 of the appliance in such a manner that it is capable of closing, thereby causing the lamp 5 to illuminate, even when the door 4 is closed, so as to transmit the afore cited coded light information outside the appliance through said photoconductive means.

[0014] In the example illustrated in Figure 1, a receiving end 10 of the cable 7 is preferably adjacent to the lamp 5, whereas the opposite (emitting) end 11 thereof may be arranged in an appropriate position that is visible from the outside of the home appliance, such as for instance in correspondence of a control panel.

[0015] For example, the programme sequence control unit 9 may be set so as to be adapted to determine the illumination of the lamp 5, even if the door 4 is closed, in such a manner as to indicate, through the optical-fibre cable 7, pre-determined operating conditions of the home appliance, such as for instance the various phases of an operating programme or cycle being performed, the conclusion of the same operating cycle, and so on.

[0016] The light information transmitted outside the cavity 3 may be coded in a variety of manners. So, according to a basic example, the lamp 5 may be illuminated, either continuously or in a blinking manner, simply at the end of an operation cycle of the appliance. As an alternative or in addition thereto, the lamp 5 may be switched on to blink at differentiated frequencies, according to needs, in view of distinguishing among the

various kinds of light information that are from time to time detected by the user.

[0017] The above cited light information may also be coded chromatically, in various manners that are well within the ability of those skilled in the art who have a knowledge of the present invention.

[0018] According to the embodiment illustrated in Figure 2, for instance, instead of having the lamp 5 energized or caused to illuminate in a coded manner, provision can be made of a moving chromatic filter 12 that has several differently coloured sections 15 capable of being selectively interposed between the lamp 5 and the end 10 of the optical-fibre cable 7. In order to selectively switch over the various sections 15 of the filter 12, the latter can for instance be caused to rotate by means of an appropriate electric drive motor 13, or the like, controlled by the programme sequence control unit 9 of the home appliance and associated to suitable drive means 16.

[0019] As an alternative thereto, the chromatic codification of the light transmitted outside the home appliance may be brought about through the use of lighting means 5 provided in the form of one or more LEDs, or the like, at least one of which is energized in a variable manner, under the control of the programme sequence control unit 9, so as to correspondingly emit a light of variable colour.

[0020] In any case, the lamp 5 goes on performing its basic, traditional duty of selectively lighting up the inner cavity 3 of the home appliance, in particular when the access door 4 thereof is being opened.

[0021] It will be appreciated that the above described home appliance may be the subject of a number of modifications without departing from the scope of the present invention.

[0022] With reference to Figure 3, for example, in the case that the home appliance is provided with at least a substantially see-through window 14, in particular in the door 4 as this is a largely known case in connection with such home appliances as cooking ovens and dish-washing machines, the photoconductive means may be formed by the window itself, without any need for an additional optical-fibre cable 7 to be provided. The number of component parts needed to implement the above described function can in this way be further reduced.

[0023] Furthermore, in the case that the above-cited window 14 is provided, the switch 6 may be operated manually, as an alternative or in addition to its being operatively linked with the door 4, to selectively turn on the lamp 5 in order to light up the functional cavity 3 of the home appliance also when the door 4 thereof is closed.

vided with lighting means adapted to be operated selectively to illuminate said cavity, **characterized in that** there are provided photoconductive means (7; 14) adapted to transfer at least part of the light generated by said lighting means (5) outside the home appliance in the form of coded light information under control of a programme sequence control unit (9).

2. Home appliance according to claim 1, **characterized in that** said photoconductive means (7; 14) are adapted to transmit said coded light information outside the home appliance even when said door (4) is closed.
3. Home appliance according to claim 1, **characterized in that** said photoconductive means comprise at least an optical-fibre cable (7), or the like, extending substantially from said lighting means (5) to the outside of the home appliance.
4. Home appliance according to claim 1, **characterized in that** said photoconductive means comprise at least a substantially see-through window (14).
5. Home appliance according to claim 3, **characterized in that** an end portion (10) of said optical-fibre cable (7) is arranged adjacent to the lighting means (5), whereas an emitting end portion (11) of the same cable is arranged in a position that is visible on the outside of the home appliance.
6. Home appliance according to claim 1, **characterized in that** said light information is coded chromatically.
7. Home appliance according to claim 1, **characterized in that** said light information is coded chromatically by means of at least a moving chromatic filter (12) having differently coloured sections (15) capable of being selectively interposed, under control of said programme sequence control unit (9), between said lighting means (5) and said photoconductive means (7; 14).
8. Home appliance according to claim 7, **characterized in that** said sections (15) of the filter (12) are adapted to be changed over selectively by means of an electric motor (13), or the like, controlled by the programme sequence control unit (9) of the home appliance.

Claims

1. Home appliance comprising an outer cabinet accommodating at least an inner functional cavity capable of being closed by an access door and pro-

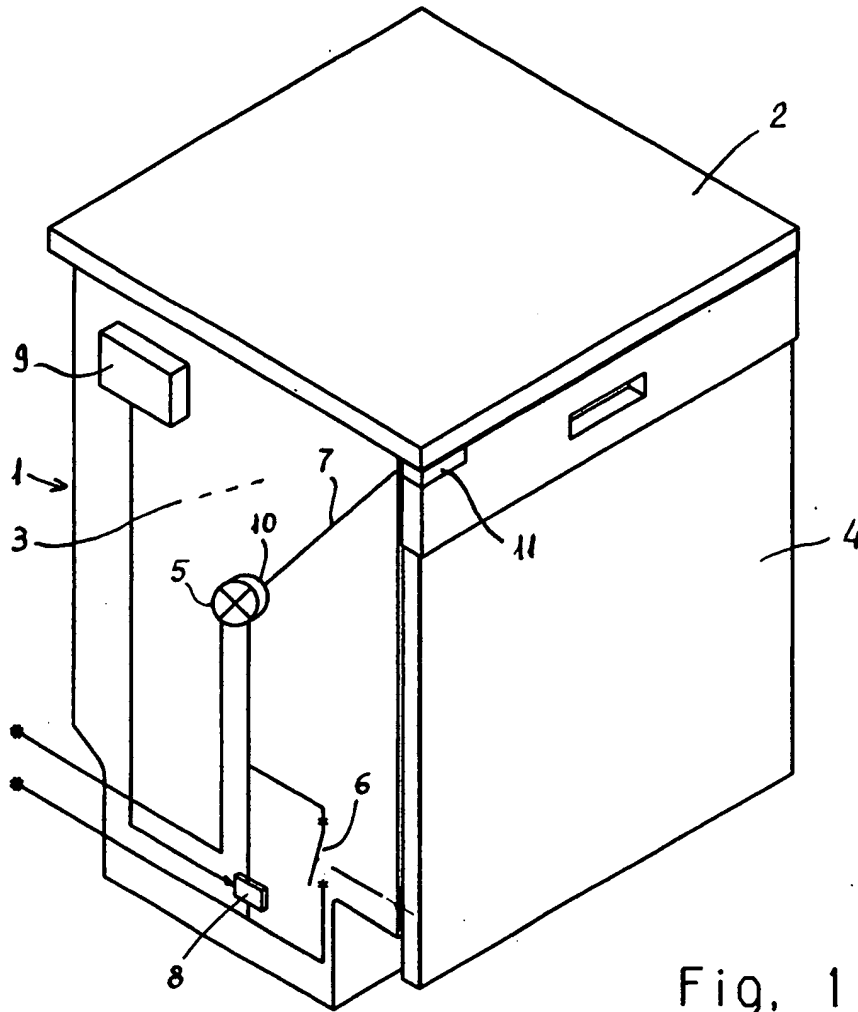


Fig. 1

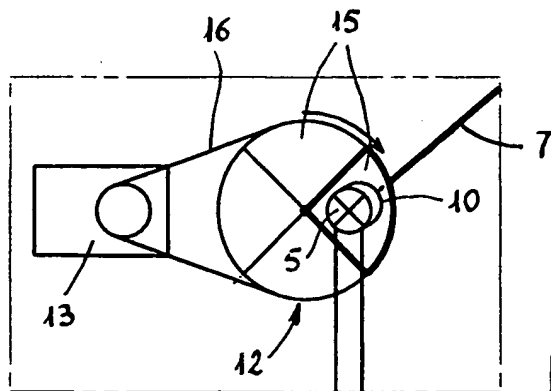


Fig. 2

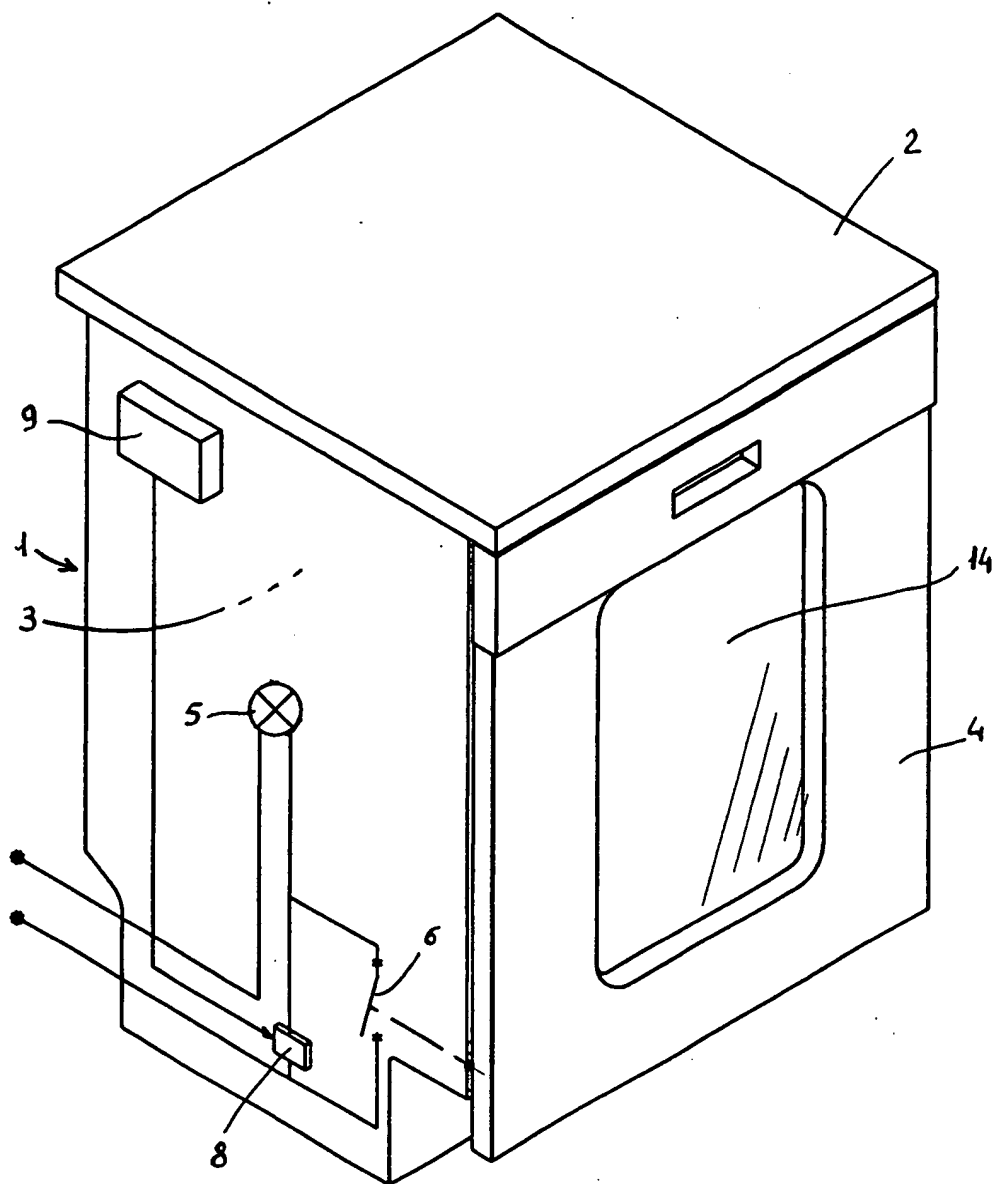


Fig. 3